

## CLAIMS

1. An apparatus for receiving BS digital broadcast, which regenerates a carrier by a carrier regeneration loop and establishes phase synchronization to  
5 decode a PSK modulation signal regenerated from a modulated signal to a digital signal,

### CHARACTERIZED IN THAT

- a phase of a signal point indicated by the PSK modulation signal outputted from said carrier regeneration loop is shifted by a phase determined on  
10 the basis of the type of PSK modulation technique applied to a received signal and a phase error contained in the PSK modulation signal, then the digital signal is decoded, and the carrier is regenerated on the basis of a phase error detected by performing burst receiving only in a predetermined signal interval.

- 15 2. An apparatus for receiving BS digital broadcast, comprising:  
carrier regenerating means for regenerating a carrier by detecting a phase error contained in a PSK modulation signal regenerated from a modulated signal;  
absolute-phasing means for absolute-phasing a PSK modulation signal in which the phase of a signal point is adjusted by a carrier regenerated by said  
20 carrier regenerating means;  
phase shift means for shifting the phase of a signal point indicated by a PSK modulation signal absolute-phased by said absolute-phasing means; and  
decoding means for decoding a digital signal from a PSK modulation signal in which the phase of a signal point is shifted by said phase shift means,

- 25 CHARACTERIZED IN THAT

said carrier regenerating means is adapted to regenerate a carrier on the basis of a phase error detected by performing burst receiving only in a predetermined signal interval.

- 5     3.     The apparatus for receiving BS digital broadcast according to claim 2, said carrier regenerating means comprises:

         a waveform data generator circuit for generating waveform data indicating the regenerated carrier;

- 10           a complex calculator circuit for executing a complex calculation of the waveform data generated by said waveform data generator circuit and a PSK modulation signal regenerated from the modulated signal;

         a band limiting filter for limiting a band of a PSK modulation signal in which the phase of a signal point is adjusted by the complex calculation of said complex calculator circuit;

- 15           a latch circuit for latching a PSK modulation signal in which the band is limited by said band limiting filter;

         an error detector circuit for detecting a phase error by comparing the phase of a signal point indicated by a PSK modulation signal latched by said latch circuit with an absolute phase; and

- 20           a loop filter for applying smoothing processing to an error signal indicating the magnitude of a phase error detected by said error detector circuit to supply the smoothed error signal to said waveform data generator circuit.

- 25     4.     The apparatus for receiving BS digital broadcast according to claim 3, comprising:

         a plurality of filter circuits for filtering the error signal indicating the magnitude of the phase error detected by said error detector circuit, only in the

signal interval corresponding to the type of the PSK modulation technique applied to a received signal,

wherein said phase shift means shifts the phase of a signal point indicated by the PSK modulation signal, by a phase corresponding to the error signal  
5 filtered by said plurality of filter circuits.

5. The apparatus for receiving BS digital broadcast according to claim 4, said decoding means comprises:

control data decoding means for decoding data indicating the multiplex  
10 structure of a frame formed by the decoded digital signal from a PSK modulation signal; and

identification signal generating means for generating a modulation identification signal indicating the PSK modulation technique applied to a received signal identified by data decoded by said control data decoding means,  
15 wherein said plurality of filter circuits respond the modulation identification signal generated by said identification signal generating means and to identify the type of the PSK modulation technique applied to a received signal, and

wherein said phase shift means selects the error signal filtered by said plurality of filter circuits in accordance with the PSK modulation technique  
20 identified from the modulation identification signal generated by said identification signal generating means so as to shift the phase of a signal point indicated by the PSK modulation signal, by a phase corresponding to the selected error signal.

25 6. The apparatus for receiving BS digital broadcast according to any one of claims 2 to 5, comprising:

pattern detecting means for detecting a frame synchronization pattern from the PSK modulation signal in which the phase is shifted by said phase shift means,

wherein said absolute-phasing means absolute-phases the PSK modulation signal in accordance with whether or not the frame synchronization pattern detected by said pattern detecting means is reversed.

7. A method for receiving BS digital broadcast for regenerating a carrier by a carrier regeneration loop and establishing synchronization, to decode a digital signal from a PSK modulation signal,

CHARACTERIZED IN THAT

the phase of a signal point indicated by the PSK modulation signal outputted from said carrier regenerating loop is shifted by a phase determined on the basis of the type of a PSK modulation technique applied to a received signal and a phase error contained in the PSK modulation signal, and then, the digital signal is decoded, and the carrier is regenerated on the basis of a phase error detected by performing burst receiving only in a predetermined signal interval.

10031085 011602